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## REGIONAL DEVELOPMENT

### UZSSR COUNCIL OF MINISTERS ON ECONOMY

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 8, Aug 81 pp 3-14

[Article "Future Economic Development of Uzbekistan" by N. Khudayberdyev, chairman of the UzSSR Council of Ministers]

[Text] The entire multi-faceted working and socio-political life of the country and of each one of its republics passes today under the unabated influence of the decisions of the historic 26th CPSU Congress, which opened up new horizons of economic and social progress and elaborated a majestic program of communist construction applicable to the concrete conditions of the 1980's.

The Report of the CC CPSU presented by the general secretary of the CC CPSU, comrade L. I. Brezhnev and the decisions of the congress signify a new stage in the development of Leninist principles of communist construction, the organic unification of politics and economics, and the perfection of social relations. This, in essence, is a new chapter in the theory of scientific communism, which provides an answer to the most vital questions of our time.

The entry of our country into the stage of developed socialism opens up a broad scope for the operation of the basic economic law of socialism, which is directed towards the allround development of the individual and the fullest satisfaction of the material and spiritual requirements of man.

The successful completion of the 10th Five-Year-Plan is the firm basis for the realization of the tasks set by the party congress with respect to the further economic and social development of the country. Summing up the development of the national economy of the country during the past five-year-plan, L. I. Brezhnev in his Report to the 26th CPSU Congress underlined the correctness of the economic strategy of the party and noted that the country has made important advances in all directions of the creation of the material-technical base of communism. In the great fraternal collaboration of the republics of the USSR, in the unified national economic complex of the country, and under the leadership of the republic party organization, the workers of Soviet Uzbekistan have also achieved great successes.

The achievements of the republic are highly valued by the party and the government. For the ahead-of-schedule fulfillment of the tasks of the 10th Five-Year-Plan with respect to purchases of cotton, grain and other agricultural products, Uzbekistan was decorated with the third Order of Lenin. During the years of the five-year-plan and on the basis of its results, more than 75,000 progressive production

workers were awarded orders and medals of the Union of Soviet Socialist Republics, and 98 were honored with the high title of Hero of Socialist Labor.

For the national economy of the republic, the past five-year-plan is noteworthy above all, because of the fact that there was a significant increase in the potential of all sectors and intersectorial and intraterritorial proportions have become more perfect.

The scales of the development of national production are impressive. The average annual rate of growth of the gross social product and the national income came to more than 5 percent for the five-year-plan. The volume of the combined social product, which characterizes the scales of production in the republic, exceeded 33 billion rubles in 1980 (for comparison: in 1975--26 billion rubles).

Not without interest is the following comparison: in 1960 Uzbekistan produced a social product valued at 32 million rubles a day, but in 1980 the figure was 137 million rubles (in prices of the corresponding years). The national income produced--a basic source of increasing the prosperity of the workers and of accumulation-- in 1980 increased 1.3-fold by comparison with 1975 and reached 16 billion rubles.

Moreover, there was an increase in the absolute volume and the significance of one percent of growth. The "weight" of every percent of growth in national income turned out to be 1.4 times greater for the 10th Five-Year-Plan than for the 9th Five-Year-Plan.

Such great absolute volumes of the social product convincingly speak of the significant growth of the economic and scientific-technical potential of the republic. Cadres have developed, and their general and professional-technical level of training has increased. The national economy of Uzbekistan is now capable of dealing with even the most complex economic problems.

The workers of the republic express the feelings of nationwide gratitude to the CC CPSU, to the Politburo of the Central Committee, to the Soviet government, and to the general secretary of the CC CPSU, the chairman of the Presidium of the USSR Supreme Soviet, L. I. Brezhnev, for their constant attention to the development of the productive forces of the republic, for the implementation of measures with respect to a powerful increase in cotton-growing and all other sectors of the national economy, with respect to the development of uninhabited lands, the realization of an unprecedented program of irrigation and land improvement, and for their concern for the flowering of science and culture, as well as the increase of the prosperity of the people.

Everything in which our republic is now rich, everything that she attained in the course of the construction of socialism and communism--is the fruit of the indestructible friendship and mutual assistance of the peoples of our country. The Uzbek people is deeply grateful to its elder brother and true friend--the great Russian people, which from the first days of the establishment of Soviet power in Turkestan has extended enormous fraternal assistance to the republic in the stormy development of its economy and culture.

The successes of the republic graphically demonstrate the advantages of the socialist planned system of economic operation.

Soviet Uzbekistan is a powerful industrial-agrarian republic. A leading role in its economy has been firmly consolidated for the multi-sector industry. During the years of the 10th Five-Year-Plan, industry realized production above the plan amounting to 1.6 billion rubles.

In the course of the five-year-plan, most intensive development took place in the industries determining scientific-technical progress: The power industry, machine building, chemical industry, ferrous and nonferrous metallurgy.

In complete conformity with the policy of the party aiming at an increase in the living standard of the people, the volume of output of consumer goods grew by 47 percent during the five-year-plan.

Such impressive growth of industrial production was furthered by the placing into service of approximately 100 large industrial enterprises and shops. Among them are four power-generating units of 300,000 kilowatts each at the Syrdar'inskaya State Regional Electric Power Station, the third phase of the Almalyksiy chemical and the second phase of the Smarkandskiy superphosphate plants, the production of caprolactam in the Elektrokhimprom Association in the city of Chirchik, the production of triacetate cellulose in the Ferganskiy Plant of nitrogen fertilizers, new capacities in the Uzbek Metallurgical Combine imeni V. I. Lenin, the Navoiyskiy Cement Plant, capacities for the processing of copper ore at the Almalykskiy Mining and Metallurgical Combine.

Among the new enterprises producing consumer goods, first rank goes to the Khivinskiy Carpet, the Novotashkentskiy Canning, and the Andizhanskiy Cotton Combines, the Kuvasayskiy China and the Urgenchskiy and Gulistanskiy Oil-Extracting Plants, as well as the Almalykskaya Carpet and the Shakhrisabzskaya Silk Filature Mills.

Paramount significance is being given to the expansion and technical reequipment of operating enterprises. The Tashkent Sredazelektroapparat, Sredazkabel', and Uzbektekstil'mash Associations are undergoing basic reconstruction. Thanks to reconstruction, the Tashkent Association for Furniture, the Samarkand Plant for Lift Construction, and the Tashkent China Plant have begun to turn out much more production.

The enormous production potential of industry, in conjunction with the large mineral, raw material and the rapidly-growing labor resources create the prerequisites for the further accelerated growth of industrial production. The "Basic Directions of the Economic and Social Development of the USSR in the Years 1981-1985 and in the Period to 1990" project an increase of 28-31 percent in the volume of industrial production in the UzSSR in the 11th Five-Year-Plan.

What are the prospects of the growth of the basic sectors of industry in the 11th Five-Year-Plan?

The "heart" of the national economy, its "motor", is, without a doubt, the power industry. In 1985 it is planned to bring the production of electric power to 44-45 billion kilowatt hours or to increase it 1.3-fold by comparison with 1980.

The beginning of the current five-year-plan is marked by the completion of the construction of the largest State Regional Electric Power Station in Central Asia, the Syrdar'inskaya GRES. The total capacity of its 10 power-generating units is 3 million kilowatts. It has been constructed in the city of Shirin, next door to the Farkhadskeya State Regional Electric Power Station. Like Farkhad and Shirin revived from the legend, a thermal and hydraulic power station stand side by side now, symbolizing the electric power might of Uzbekistan.

The 11th Five-Year-Plan will become the birth period of two more power giants--the Angrenskaya-2 and the Talimardzhanskaya thermal power stations. At the first of them plans call for the placing into operation of two power-generating units by the end of the five-year-plan. The progress of hydraulic power engineering will be secured by the placing into operation of the electric power stations at the Tuyamuyunskiy and Andizhanskiy water reservoirs.

Uzbekistan has at its disposal a sufficiently powerful fuel base. Of paramount importance are the deposits of natural gas, which--in addition to satisfying internal demands--is also supplied to other Central Asian republics, Kazakhstan, the Urals, and the central regions of the country. It is noteworthy that the proved reserves of gas in the republic are not diminishing, but, on the contrary, are increasing. Ever new gas-bearing areas are placed under an industrial load. For fruitful work in this direction, a group of scientists and specialists of Uzbekistan was awarded prizes of the USSR Council of Ministers in 1981.

The center of gas extraction and processing has moved in recent years from Bukharskaya Oblast to Kashkadar'inskaya Oblast. Here plans call for the doubling of production output at the Mubarek'skiy gas processing plant and the erection of a new plant in Shurtan. Besides basic production--freed from the admixture of inflammable gas--both enterprises will guarantee an annual production of about 500,000 tons of sulphur--a most valuable raw material for the chemical industry. As far as the gas itself is concerned, its extraction in 1985 will reach the level of 37-38 billion cubic meters for the entire republic.

The Angrenskiy Section (extraction in it is carried out by means of strip mining) is the basic coal base of Uzbekistan. At the present the strip mining section is being reconstructed--which will guarantee an adequate supply of fuel for the future Angrenskiy GRES-2 [State Regional Electric Power Station].

Large reserves of coal are found in Sukhandar'inskaya Oblast. There it is planned to increase the extraction at the Shargun'skiy field and to develop a new one--the Baysunskiy field. This complex of measures will guarantee an annual output of 7.2 million tons in the republic by the end of the five-year-plan. Moreover, there is a sizable increase in the output of high-quality coal.

Ferrous metallurgy is undergoing significant development. On the basis of the utilization of ferrous metal scraps of the Central Asian economic region, an expansion of the Uzbek Metallurgical Combine imeni V. I. Lenin in the town of Bekabad

was carried out. To the traditional production of the combine--rolled stock--a new type--electric furnace steel--was added. Here a large electric steel melting complex with modern, highly-productive equipment was created. The current five-year-plan envisages the further expansion of its capacity by 500,000 tons of electric steel per year. Rolled stock production is also being expanded. The output of rolled stock in the republic in 1985 will increase 3.6-fold by comparison with 1980.

Further development will take place in non-ferrous metallurgy. The geologists of the republic have made known very rich reserves of useful minerals and mineral raw material. To put them to work for the national economy, new mines are being opened up. Not long ago, such a mine sprang up in Dzhizakskaya Oblast, and side by side with it the town of Mardzhanbulak was established. In the near future Uchkulach will be placed into service as an operating mine.

Preparatory work is being completed and exploitation is beginning at the Khandizinskiy deposit of polymetallic ores in Surkhandar'inskaya Oblast and the deposit of wolfram in Samarkandskaya Oblast. The further development of the gold extracting industry is being projected.

The chemical and petrochemical industry is playing an increasingly large role in the economy of the republic. During the past decade the industry secured a significant growth in production output. However, now this is already not enough: By the end of the five-year-plan the chemical industry will increase its production volume another 1.8-fold, and the petrochemical industry--1.6-fold.

Mineral fertilizers are the basis for increasing the yield of agricultural crops. Their output will grow from year to year. If in 1975 6.1 million tons (in conventional fertilizers) were produced, in 1985 9.6 million tons will be obtained. Moreover, preference is being given to concentrated types of fertilizers. In 1980 a little more than 3 million tons of them were manufactured, in 1985 6 million are being planned.

There will be a several-fold increase in the production of chemical means for the protection of plants. Uzbekistan has become the birthplace of domestic Kotoran --a most valuable cotton herbicide, which destroys any weeds in the cotton crops. During the past year, 760 tons of it were produced, in 1985 2,000 tons will be produced. Kotoran is manufactured in the city of Novoy. This is where capacities for the production of new types of effective herbicides--fazolan, akreks, and treflan--will be introduced. There will be a large increase in the volume of output of defoliant from chlorate-magnesium for the pre-harvest removal of the cotton plant leaves.

There will be a significant increase in the production of chemical fibers, synthetic resin, plastics, polymer films, cleansing products and chemical articles for household use.

In the economy of Uzbekistan the leading place is occupied by the national economic agro-industrial cotton complex, the industrial part of which includes agricultural machine building, cotton fabric, food, chemical and microbiological industries.

More than 70 percent of the total volume of industrial production of the republic is connected with the production and processing of cotton.

Among the industrial sectors of the complex the leading role belongs to tractor and agricultural machine building. The machine building plants of Uzbekistan manufacture the following for cotton-growing farms of the country: Specialized tractors-cultivators, sowing machines, cultivators, machines for the pre-sowing cultivation of the fields, cotton-picking machines, tractor trailers, and agricultural pest control equipment.

In recent years new types of machinery have been developed. The "Tashsel'mash" Plant [Tashkent Agricultural Machinery Plant] is turning out cotton-picking machines for the collection of fine-fibered cotton varieties, and also its removal in tiers and the gathering of seed cotton. Serial production is under way of a principally new cotton-picking machine with the State Emblem of Quality--a machine with a pneumatic picker and a small-size cleaner.

The Tashkent tractor plant has developed the production of a more energy-saturated tractor modified for cotton under the trademark MTZ-80KH. The same plant turns out tractor trains equipped with a pneumatic brake system and capacious trailers.

The output of tractors modified for cotton in 1985 will be 1.3 times greater than in 1980. At the present time, when a powerful base for tractor building has been created and skilled cadres have been trained, the primary task is the transition from the assembly and pre-equipment of the tractors supplied by the Minsk Tractor Plant to the organization of the whole cycle of their production in the republic, for which all necessary prerequisites exist.

Along with agricultural machine building, rapid development will take place in machine building for light, food, and chemical industry, construction, road, as well as heavy and transportation machine building. Leading development will take place in the electrotechnical, electronic and other sectors of industry.

The high rates of development of machine building and the increase of its relative weight in the industrial production of the republic are a clear manifestation of the observance of the requirements of the law of advantageous growth of the means of production.

Among the enterprises of light industry the leading place belongs to cotton-cleaning plants. The system of cotton-cleaning is a production-raw materials sector, which is organically linked with cotton-growing as well as with many processing enterprises. At present there are 107 cotton-cleaning plants and 490 cotton procurement centers in the republic, many of them have drying and cleaning shops.

The measures projected for the 11th Five-Year-Plan will guarantee the safety of the valuable natural qualities of cotton-raw material and will increase the quality of the cotton fiber. The further technical reequipment of the industry is being planned, including, in particular, the equipment of all procurement centers with drying and cleaning shops. New cotton-cleaning plants will be built, as well as a significant number of procurement centers and warehouses for the storage of cotton-raw material and seeds.

The most important and urgent task of our day is the expansion of the production and the improvement of the quality of consumer goods.

In the republic this matter is receiving the most careful attention. At the 20th Congress of the Communist Party of Uzbekistan the problems of the further accelerated development of the sectors of industry of group "B" were thoroughly examined. Questions of increasing the production of consumer goods were extensively discussed at the meeting of the party and economic aktiv of the republic, in the oblasts, cities and rayons.

Our industry has at its disposal a significant base for the output of mass consumption items. More than 720 associations and enterprises are engaged in their manufacture.

Recent years have seen the creation of machine carpet weaving, the development of the production of steel, enameled and glass plates and dishes, household refrigerators, kitchen furniture, perfume and cosmetic items, jewelry, and many household products. The output of traditionally national silk fabrics, especially khan satin, and articles of the national artistic trades will be increased.

In the republic there are quite a few work collectives where front-rank production workers, engineers, artists and modellers persistently attain an expansion of the assortment and an improvement of the quality of the articles that are manufactured.

The total volume of the production of consumer goods in 1980 amounted to more than 4 billion rubles. By 1985 their output must be brought up to 5.7 billion rubles. Moreover, special significance is attached to increasing the output of goods that are in high demand: Cotton and silk fabrics, knitted articles, stockings and socks, china and ceramic plates and dishes, children's clothing and footwear, cultural-personal and household items--the goal being the elimination of the deficit in these products in the shortest possible time.

The growth that is being planned will be secured above all by virtue of the reconstruction and technical reequipping of operating enterprises and better utilization of production capacities. Reconstruction will be completed at the Tashkentskiy and Ferganskiy Textile Combines, the "Malika" Association for Knitwear, and the Margilanskoye Association for Avrorov's "Atlas" Fabrics. The second phase of the Bukharskiy Textile Combine and new capacities at the Andizhanskiy Cotton Fabric Combine will go into operation. The Nukuskiy Cotton Fabric Combine, the Dzhizakskaya Cotton Spinning and Stockings and Socks Mills, as well as a number of other enterprises of light, local and furniture industries being constructed or reconstructed will begin to turn out production.

Great attention is being given to the further development of industrial sectors producing food-stuffs. New dairy plants will begin to operate in the cities of Chirchik, Karshi, Termez, Namangan, Urgench, Kattakurgan, and Mubarek. Buildings for modern meat combines will rise in Dzhizak and Dzhambay. The oil and fat and the baking industries will be strengthened. There will be a considerable increase in the production of canned vegetables and fruit juices. Pond fish-breeding will be expanded. The fish catch will reach 50,000 tons a year.

The ministries, departments, local party, soviet and economic organs are actively searching out and setting into motion additional reserves for the expansion of the output goods. Special attention is being given to the use of local raw material resources and business wastes of production. For the manufacture of goods intended for cultural and personal use and household use, enterprises of heavy industry, the building materials industry, agricultural technology, construction and a number of other ministries and departments are being involved on a broad scale. Many kol-khozes, sovkhozes and forestry enterprises have begun to become engaged in real earnest in the production of consumer products. Measures are being taken in regard to the broad application of forms of work carried out at home.

In the present year it is planned to turn out 250 million rubles worth of consumer goods in addition to the plan.

On the basis of the consistent realization of the agricultural policy of the CPSU, the large-scale tasks of the intensive development of agricultural production and its chief sector--cotton-growing--are being successfully solved in the republic.

Gross production in the 10th Five-Year-Plan increased by 25.5 percent by comparison with the 9th Five-Year-Plan, with the target being 22 percent.

During the five-year-plan 28.5 million tons of cotton raw material were produced, which was 4 million tons more than during the 9th Five-Year-Plan. In 1980 the record quantity of "white gold" of 6,240,000 tons of cotton, including 358,000 tons of fine-fiber varieties, was sold to the state.

The yield of the cotton plant increased by 5 centners and amounted to 33.2 centners per hectare. Three-fourths of the total increase in cotton was secured by virtue of the intensive factor--the growth of productivity, which to a decisive extent was determined by an increase in the production standards of agriculture, by the mastery of cotton-alfalfa crop rotations, and by the extensive introduction of new progressive technology and advanced agrotechnology on the farms.

Along with the development of cotton-growing, great attention was given to the increase in the production of food crops. The average annual production of grain increased 2.2-fold during the 10th Five-Year-Plan compared to the preceding one. The gross harvest of rice in the past years came to 507,000 tons and of shelled corn --1,240,000 tons. These figures are especially graphic if it is remembered that 10 years ago 185,000 tons of rice and a total of 66,000 tons of corn were harvested.

There has been a large increase in the gross harvest of vegetables, melons, potatoes, fruit, and grapes. During the years of the past five-year-plan, 13.7 million tons of these valuable food products were purchased, which exceeds the volume of state purchases during the preceding five-year-plan by 58 percent.

Questions of the steep increase of live-stock breeding are being urgently solved in the republic. The question is to make this vitally important sector as effective as cotton-growing. During 1976-1980 the production of meat increased by 31 percent, milk--by 42 percent, and eggs--by 65 percent.

The most typical peculiarity of the contemporary development of agricultural production is its conversion to industrial technology, the extensive introduction of chemicalization and complex mechanization. For this the kolkhozes and sovkhoses have a sufficient material-technical base at their disposal. For example, the power capacity of the republic's agriculture in 1980 amounted to 20.5 million horse powers as compared to 8.7 million in 1965. This made it possible to raise the power availability per worker almost two-fold.

A policy with respect to the intensification of specialization and concentration of production on the basis of inter-farm cooperation and agroindustrial integration is being systematically pursued.

The agriculture of the republic has entered a new important stage in its development. The cotton-growers pledged to bring the production of raw cotton to 30 million tons in the 11th Five-Year-Plan.

The greatest significance is being attached to the elaboration of a food program that will become an integral part of the entire five-year-plan.

We are faced with securing the following average annual production: Grain--2.8 to 3 million tons; vegetables--2.4 to 2.5 million; meat (in slaughter weight)--400 to 410,000; milk--2.5 to 2.7 million; wool--20 to 21,000 tons; skins of karakul--2.25 million. Further development will take place in viticulture, melon-growing, and fruit-growing.

The silk farmers of the republic are attaining high indicators. This sector is developing steadily. During the present year 32,000 tons of silkworm cocoons were purchased, which is considerably above the plan.

Irrigation farming is the basis of the development of the productive forces of Uzbekistan and a powerful means of intensification of agricultural production. At the beginning of 1981, the total area of irrigated land in the republic came to 3,518,000 hectares or increased 2.5-fold by comparison with 1913. The soil improvement work after the May (1966) Plenum of the CC CPSU acquired especially wide scope. At present approximately 100,000 hectares of newly irrigated land are brought under cultivation.

An instructive example of the complex development of new lands is the rich and valuable experience of the irrigation of the Golodnaya, Karshinskaya, Surkhan-Sherabadskaya, and Dzhizakskaya Steppes, as well as the lands and lower reaches of the Amudar'ya in Karakalpakskaya Autonomous Soviet Socialist Republic and in Khorezmskaya Oblast, where large, highly-efficient regions of cotton-growing, rice-growing and cattle-raising have been and are being created. During the past two five-year-plans a total of about 1 million hectares of new irrigated lands have been, and are being, created. A steady and dynamic development of agriculture, accelerated production growth rates, and the yearly overfulfillment of state plans with respect to all basic types of agricultural production by Uzbekistan have been secured.

All this is the result of the skillful combination of the intensification of production and the expansion of areas requiring irrigation. It is gratifying that

such a method of conducting agriculture yields a weighable economic effect: Precious raw material for industry and food for the population is being supplied in constantly growing quantity. For this reason, along with measures for the further increase of productivity, the complex development of new huge tracts of irrigated land will continue in the current five-year-plan. Ahead lies the necessity of bringing under cultivation 485,000 hectares of land needing irrigation and the irrigation of 1.5 million hectares of pasture land.

The potential resources of land suitable for irrigation in the republic are estimated at 7.5 million hectares. The further development of the entire agro-industrial complex in Uzbekistan depends on the solution of the problem of water supply.

In connection with the intensive expansion of irrigated agriculture and the growth of water demand through industry and for municipal and household needs even with the realization of the strictest measures in regard to saving water and its rational use, the resources of the main rivers of the region, the Amudar'ya and the Sydar'ya, may be exhausted within the coming decade.

Coming to the fore as an urgent task is the acceleration of the transfer of part of the flow of the Siberian rivers into the basin of the Aral Sea, which will be of great significance in the further increase of the productive forces of Kazakhstan and the Central Asian republics.

Capital construction is being improved. The five-year-plan target with respect to the introduction of fixed capital, the assimilation of capital investments, and the volume of construction and assembly work has been successfully fulfilled. The volume of unfinished construction has decreased.

If during 1976-1980 some 24.7 billion rubles were invested in the development of the national economy, which provided for the introduction of fixed capital of almost 24 billion rubles, the scales of capital construction in the 11th Five-Year-Plan will increase even more.

Paramount attention is being given to the direction of capital investments in the development of the most promising sectors of the economy, to the concentration of the means, resources and capacities of the construction organizations at the most important and underway projects so as to guarantee that they will be put into operation in due course.

In view of the enormous volumes of capital construction, paramount importance is being attached to the accelerated development of the building materials industry and the construction industry. Large bases of the construction and the construction materials industry are being created--distinctive outposts for the development of new regions and the construction of industrial and agricultural complexes; solutions are being found to the problem of the elimination of the deficit in local building materials, etc.

The growing scales of the development of the national economy make high demands on the production infrastructure--the work of transportation and communication.

These sectors are constantly developing and the capacity and maneuverability of the entire transportation system of our region is being increased. New railway lines will be constructed, as well as a large number of access railways to industrial enterprises.

There will be a great increase in the motor vehicle transportation fleet and the road network will be expanded. Plans call for a significant development of air transportation and the expansion of airports. The installation of the Tashkent subway will continue at an accelerated rate. Telephone service will be improved, especially in rural localities.

In the republic, as in the entire country, social tasks are being solved consistently. During the years of the past five-year-plan, real incomes per capita of the population increased by 17 percent, and the payments and benefits from social funds --by 37 [percent], and 3 million people moved into new living quarters and improved their housing conditions.

Retail commodity turnover reached the 10 billion mark. Now for every inhabitant of the republic sales of industrial and food products are 125 rubles higher than in 1975. Significant advances are also taking place in the industry of everyday life. More than 600 services are extended to the population.

In the fulfillment of the decisions of the 26th CPSU Congress in the republic a broad complex of measures is being realized with respect to the further improvement of services to the population, the improvement of working conditions, the everyday life and leisure of the people, and the continuous supply of food and industrial goods in mass demand. The volume of retail commodity turnover will increase about 1.5-fold. Everyday services to the population will also increase more than 1.6-fold. Serious importance is being attached to the further development of public health services and the creation of large medical institutions that are equipped with the latest equipment for providing the population more fully with all types of highly-qualified medical assistance.

The scales of housing construction are being expanded, as well as of municipal services projects, public health services, schools, kindergartens and day nurseries and cultural institutions.

Great attention is being devoted to the building of towns and rural settlements and to the improvement of its quality with regard to the climatic conditions of our kray.

The capital of our republic, Tashkent, and our ancient cities--Samarkand, Bukhara, Andizhan, Kokand, Urgench and others are being built with contemporary buildings. Widely known in the country is the experience of the architects and builders who have--in desert or semi-desert conditions--such aesthetically remarkable and architecturally meritorious cities as Navoi and Zerafshan.

At present a comprehensive program for building Tashkent has been prepared and measures have been worked out for the accelerated development of centers of virgin and newly-created regions. Purposeful work is continuing in regard to the improvement of the everyday life of the population in the city and especially in the

village. Everything that is created for Soviet people must be of good quality, comfortable and pretty.

The successful realization of the complex and responsible tasks confronting the republic in the 11th Five-Year-Plan is related, above all, to the maximally efficient use of the great potential resources and possibilities at the disposal of Soviet Uzbekistan. I would like to dwell on some of the most important aspects of their solution in greater detail.

The population and labor resources in the republic are growing at high rates. During 1970-1980 the population size of Uzbekistan increased from 11.8 to 16.2 million people. This means that on the average the population grew at the rate of 3 percent per annum. Forecast calculations indicate that high rates of population growth and growth of labor resources in the UzSSR will also continue in the future.

The prospects of the development of the national economy in the decade ahead and the high population growth rates bring to the fore as the most important task the expansion of the training of cadres of skilled workers and specialists. In this direction certain results have been achieved.

During the 10th Five-Year-Plan more than 500,000 young men and women received a profession in professional-technical schools--almost twice as many as in the 9th Five-Year-Plan. In the higher and secondary educational institutions approximately 500,000 specialists were trained.

Measures are being taken with respect to the further expansion of the training of skilled cadres. At present 488 schools are operating in the republic. In the immediate years ahead, there will be 620 of them; during the five-year-plan the training of 700,000 skilled workers is projected.

One of the effective forms of the professional orientation of youth and its preparation for work is the inter-school study and production combine. Of 258,000 graduates from secondary schools, 132,000 went to work in enterprises, construction projects, kolkhozes and sovkhozes in 1980. Many of them obtained skills in the combines we have mentioned.

The interests of the rational application of the quickly-growing labor resources of the republic require accelerated rates of development of industry, especially of its labor-intensive sectors.

In the course of the last few years, new enterprises of machine building, light and other sectors of industry have been located in Samarkand, Andizhan, Namangan, Dzhizak, Shakhrisabz, and a number of other cities of Uzbekistan.

Labor-intensive sectors will be developed at rates exceeding the schedule in the 11th Five-Year-Plan. In this connection it is important that the union ministries and departments approach the organization of enterprises comprehensively, that --along with the installation of production projects--they envisage the construction of housing, kindergartens, professional-technical schools, etc. In the solution of these problems, we are counting on the support and assistance of the USSR Gosplan and the union ministries and departments.

With a view to securing employment for the growing able-bodied population, work is actively proceeding with respect to the development of the productive forces of small and medium-size towns, urban-type settlements and centers of rural regions. Here 290 enterprises, branches and shops have been organized during the past few years, which made it possible to bring more than 30,000 people additionally into the production sphere and turn out production valued at more than 300 million rubles a year.

Branches of the "Uzbeksel'mash" [Uzbek Plant for Agricultural Machines] and "Uzbek-tekstilmash" [Uzbek Plant for Textile Machines] Production Associations and others are successfully operating. In the branch of the Samarkand Sewing Factory in the settlement of Mitani' of the Ishtykchanskiy Rayon more than 340 people are working.

In the 11th Five-Year-Plan there is a significant expansion of the development of small and medium-size towns, settlements and regional centers. Measures have been worked out and concrete tasks have been set for ministries, departments and associations.

A contemporary form of the planned solution of large national economic problems is the formation of territorial production complexes (TPK). Proceeding from this, the 20th Congress of the Communist Party of Uzbekistan adopted a decision on the elaboration of the basic directions for the formation and development of the Karshinskiy and Dzhizakskiy TPK. Their significance for the further development of the republic may be judged by the fact that during the decade ahead it is planned to increase substantially the production of raw cotton, to raise sharply the collection of grain, vegetables, fruit and grapes, and to increase the production of livestock products; to obtain a major increase in the extraction of gas and a number of nonferrous-metal ores, as well as the production of building materials and other industrial production.

Serious importance is attached to the increasing equalization of the development of the industrial forces of the oblasts and rayons of the republic. The 10th Five-Year-Plan saw the ahead-of-schedule realization of the development of the economy of the Karakalpakskaya Autonomous Soviet Socialist Republic, the Dzhizakskaya, Syrdar'inskaya, Khorezmskaya and other oblasts, which made it possible to extend their production specialization and to solve large national economic tasks quickly.

In the present five-year-plan work will continue in regard to the perfection of the territorial organization of production. Purposeful comprehensive programs have been prepared for the development of the productive forces of the Karakalpakskaya Autonomous Soviet Socialist Republic, the Khorezmskaya, Dzhizakskaya, Syrdar'inskaya, Kashkadar'inskaya and a number of other Oblasts for the period up to 1990.

The efficient use of the great potential resources for economic growth at the disposal of Uzbekistan depends in many respects on the development of science and the active introduction of the achievements of scientific-technical progress into production. The forces of the Academy of Sciences of the UzSSR, the Central Asian Division of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin, and other scientific institutions are concentrated on the problems which bring science closer to the needs of industry and agriculture.

There has been expansion in the range of research carried out by yhr scientific organizations of the republic within the framework of All-Union and regional programs for the solution to large national economic and scientific problems in the sphere of agro-industrial, fuel and energy, construction, gas and chemical, and other complexes.

Analyzing what has been achieved from the perspectives of the high demands made by the 26th CPSU Congress, we realize that in a number of sectors of the national economy of the republic there are still quite a few unused reserves and possibilities, shortcomings and bottlenecks.

Taking this into account, the republic party organization, with a view to the successful solution of the indicated problems of economic development, devotes unremitting attention to every conceivable improvement in the administration of the national economy, the perfection of planning, and the improvement of the style and methods of work of the ministries and departments, soviet and economic organs, and the strengthening of state and plan discipline. The responsible role in this belongs to the planning organs. The decree of the CC CPSU and the USSR Council of Ministers of 12 July 1979 "On the Improvement of Planning and the Strengthening of the Influence of the Economic Mechanism on the Increase in the Efficiency of Production and the Quality of Work" is continuously found at the center of their attention.

Problems of increasing the efficiency of national production, of the dynamic and balanced development of all sectors have begun to occupy the main place. Special attention is being given to questions of the introduction of the achievements of science and technology, highly-efficient technology, the increase of the capital-output ratio, the improvement of the utilization of production capacities, the increase of labor productivity and the coefficient of the shift system of equipment, and of the economic and rational use of raw material and fuel and energy resources. Paramount significance is being attached to a balance method of planning and the balance of the indicators of production with material, financial and labor resources.

At all levels of administration there has been a significant strengthening of the work with respect to the fulfillment of plan targets and socialist obligations assumed.

Special attention is being given to the increase of the profitability, the lowering of expenditures and the increase of the profit of enterprises and organizations, and the sectors of the national economy as a whole. According to plan calculations, profit from the industrial activity of enterprises of the industries subordinated to the UzSSR Council of Ministers in 1985 must grow by 37 percent in comparison to 1980. There will be an increase in the profit in agriculture, construction, and other sectors.

General schemes for administering the sectors of industry are being consistently realized. Production associations in industry in the republic are now concentrating all extraction of coal, the predominant part of oil extraction, the production of chemical fibers, synthetic ammonia, and a significant part of the production of mineral fertilizers. The production associations in light industry, machine build-

ing, and a number of other sectors have experienced a great deal of development. The transition to a two- or three-stage system of administration has made it possible to organize the work of many ministries on the basis of cost accounting.

Party and soviet organs of the republic are persistently achieving the practical realization of the measures outlined by the COSU Central Committee with respect to the improvement of planning and the economic stimulation of production and the procurement of agricultural crops, and the strengthening of the role of the Soviets of People's Deputies in economic construction.

The fuller combination of sectorial and territorial planning is one of the basic national economic tasks. It is necessary to increase the attention of the union ministries, departments and planning organizations to the proposals of the republics, to review more carefully and to take into account their planning with respect to questions of the development of the individual sectors, the location of enterprises, and the guarantee of a comprehensive approach to the solution of production problems.

The practical realization of the measure elaborated by the party with respect to the improvement of the administration and planning of the national economy will guarantee a new powerful advance in the economy of the republic, an increase of its contribution to the national economic complex of the country, and the further increase in the prosperity of the people.

Inspired by the historic decisions of the 26th CPSU Congress, the toilers of the cities and villages of the UzSSR, having actively joined in the All-Union Socialist Competition for the fulfillment of the plans of the 11th Five-Year-Plan, are making a worthy contribution to the construction of the material-technical base of communism.

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## REGIONAL DEVELOPMENT

### DEVELOPMENT OF KAZAKHSTAN'S TPK's: PROSPECTS, PROBLEMS

Moscow EKONOMICHESKAYA GAZETA in Russian No 45, November 1981 p 8

[Article by E. Turkebayev, director of the NIEIPiN [Scientific Research Institute for Economics, Planning and Norms] attached to the KazSSR Gosplan, doctor of economic sciences: "The Territorial Production Complexes of Kazakhstan"]

[Text] In Kazakhstan an intensive process of the formation and development of territorial production complexes is taking place. These complexes represent a highly-effective form of the organization of productive forces in the contemporary period. The contribution of the Pavlodar-Ekibastuzskiy, Karatau-Dzhambulskiy and Mangyshlakskiy TPK's to the economy of the country are widely known and received a high assessment in the report of L. I. Brezhnev at the 26th Congress of the party.

#### On a Scientific Basis

In the "Basic Directions. . ." the task is set to secure the further development and formation of territorial production complexes and industrial centers, especially in the regions that are being newly developed. The Scientific Research Institute for Economics, Planning and Norms attached to the KazSSR Gosplan has prepared a complex scheme for the development of the basic TPK's of the republic. The results and directions of scientific research on this subject are being discussed at scientific-practical conferences with the participation of party and soviet organs and all interested union and republic ministries and departments.

Careful justification and comprehensive analysis and discussion with the participation of the broad scientific community of the problems of the TPK are absolutely necessary since the process of their formation is exceedingly complex.

TPK's are created for the purpose of solving one or several large-scale problems, which, as a rule, are connected with the efficient use of significant sources of mineral raw material resources. The extraction and processing of fuel resources, as well as industries of ferrous and nonferrous metallurgy and machine building, for example, compose the basis of the Pavlodar-Ekibastuzskiy Complex. The Karatau-Dzhambulskiy Complex is specializing in the extraction and processing of raw material for the chemical industry. The basis of the development of the Mangyshlakskiy TPK is the exploitation of oil deposits.

In other words, interrelated industries of basic specialization are the pivot of the TPK. Usually they seek to create enterprises which represent the full cycle of

corresponding industries, as well as enterprises for the fullest utilization of raw materials and waste products. Therefore, within the framework of the TPK, in its turn, industrial complexes develop: Metallurgical, machine building, and others.

An obligatory element of the TPK are enterprises of the production and social and domestic services infrastructure, which guarantee the general services of production and the attainment of the planned living standard of the population.

Thanks to scientific substantiation it was possible to reach the greatest complexity of development, for example, of the Pavlodar-Ekibastuzskiy and Karatau-Dzhambulskiy TPK's.

The Pavlodar-Ekibastuzskiy Complex already now accounts for almost one-tenth of the gross production of industry in the republic. Within in fuel-energy, metallurgical, petrochemical and machine building complexes are forming. The coal of Ekibastuz is one of the cheapest in the country. The "Ekibastuzgol" [Ekibastuz Coal] Association operates on the basis of the resources of bituminous and brown coal. Several Heat and Electric Power Plants are in operation, and three State Regional Electric Power Stations are being built in the Ekibastuz region. The first State Regional Electric Power Plant is already in operation. The commissioning of the generating units of the second one is drawing close.

On the basis of Western Siberian oil a large petrochemical complex is being created in Pavlodar, including an oil-processing plant with petrochemical production. In the current five-year-plan the plant will be significantly expanded and will increase the volumes and products list of the production turned out. The good fuel and energy base and the presence of the necessary raw material make it possible to create in the region a metallurgical complex represented by ferrous and nonferrous metallurgy. This is where the Pavlodarskiy Aluminum Plant imeni 50-letiya SSSR and the Yermakovskiy Plant for Ferroalloys are operating.

The machine building complex, represented now by the Pavlodarskiy Tractor Plant, which puts out the DT-75M tractors, is acquiring great importance. With the expansion of the plant, the output of tractors will increase and more powerful machines of type K-700 will come off its production line.

The Karatau-Dzhambulskiy TPK is based on the utilization of local reserves of phosphorite and various types of agricultural raw material. All-Union specialization is determined by the chemical industry, by the production of sugar and by the primary processing of wool.

The chemical complex is presented by the complete technological cycle--from the extraction and processing of phosphorite raw material to the output of finished production. The "Karatau" and "Khimprom" [Chemical Industry] production associations and the Dzhambulskiy Superphosphate Plant and the the Novodzhambulskiy Phosphorus Plant produce almost one half of the yellow phosphorus in the country. Another industry developed in TPK's is machine building, which accounts for one-fifth of the machine building production turned out in the republic.

The Mangyshlaksiy Territorial Production Complex specializes in the extraction of oil and gas, gas processing and the production of plastics.

#### To Strengthen the Correlation of Industries

The experience that has been accumulated has made it possible in the 11th Five-Year-Plan to envisage the strengthening of the correlation and balance of the sectors and industries in the TPK's. In essence, every one of them is developing in accordance with a clear and purposeful program. Their composition, limit and structure are determined.

The successes in the development of the TPK's could be weighable given the condition of the improvement of capital construction. Thus, it is important to provide for the synchronization of the commissioning of interdependent industries. However, thus far we have not succeeded in attaining this. The lagging behind of the production base of capital construction, for example, will not allow bringing the capacities of the Ekibastuzskiy and Maykubenskiy Basins to the projected level within the established time limits. Such a situation also developed in the Karatau-Dzhambulskiy TPK. Questions of the planning of capital construction today to the fore into one of the first places in the formation of a TPK.

The cooperation and specialization of auxiliary enterprises remain an unresolved problem. Practically in all TPK's there are low-powered foundry shops and other services, which work simultaneously and are not centralized. All of this leads to a rise in the cost of production. For example, in the Dzhambulskiy "Khimprom" Association, a ton of castings comes to 460 rubles--more than twice as expensive as in neighboring enterprises. Specialization and cooperation would guarantee the lowering of capital investments and exploitation expenditures by 10-20 percent and the reduction of the number of workers employed by 30 percent. The latter is particularly important in view of the deficit of labor resources.

#### The Development of Industrial Centers

The formation of TPK's and a comprehensive approach to the development of the wealth of one or another region for the time being is still connected with the creation of new industries for the exploitation of new deposits of mineral and raw material resources. Meanwhile the industrial centers that are developing demand the same kind of attention.

A characteristic feature of the contemporary territorial organization of production in Kazakhstan is the development on the basis of the industrial centers of territorial production complexes and industrial junctions of different levels that have come into being.

Some of them have already basically taken shape--The Rudno-Altayskiy and the Karagandinskiy-Temirtauskiy [industrial centers]. Others may be formed in the more distant future, as, for example, the Turgayskiy [industrial center].

The determination of the sequence and the stages of development of these TPK's and industrial junctions has great practical significance for their planning and admin-

istration. Indeed, all of them were developed on the basis of uncoordinated departmental plans. As a result, guaranteeing their complex and efficient development became one of the most difficult economic problems.

In the Karagandinskiy region, for example, the perfection of intrasectorial proportions and the formation of integral industrial complexes is of fundamental significance. Let us say, the unification of efforts of the machine building enterprises of Karagandinskaya Oblast, the development of their specialization and cooperation will make it possible, first of all, to increase fundamentally the efficiency of the industry, secondly, to create large contemporary machine building, and, thirdly, to reinforce the development of a mining and metallurgical complex. This would radically change the picture of the development of the entire region. On the basis of the coal industry, ferrous metallurgy and chemical industries one could complete the formation of a TPK of union significance.

The available powerful production and scientific-technical potential serves as a reliable basis for the fact that this region could be developed a great deal more efficiently than it is now. The Gosplan of the republic already during the 9th Five-Year-Plan examined proposals for the comprehensive development of Karagandinskaya Oblast, prepared by our institute jointly with the oblispolkom. Partially they are already being introduced in practice. However, the basic part of them, especially with respect to questions of the creation of developed machine building, still remain unrealized.

Prognostic elaborations as assigned by the Gosplan of the republic and with the participation of more than 50 scientific research institutes and planning institutes being conducted for every industrial junction in Kazakhstan. The methodological guidance, coordination and generalization of the elaborations are carried out in our institute. According to the calculations and proposals of the institute, the Chimkentskiy-Kentauskiy TPK may become the largest territorial production complex. In the long run a large industrial complex is being formed in Alma-Ata and in Alma-Atinskaya Oblast. The energy base in this region will be strengthened significantly by means of the construction of new projects and the expansion of operating ones; the role of machine building will grow. In the east of the republic it is planned to speed up the development of the Rudno-Altayskiy and Semipalatinskiy industrial junctions.

#### The Planning of the PTK

The research that has been conducted and the prognoses of the development and location of productive forces that have been compiled make it possible in the presence of the substantiation of the plans to outline clearly the effective intra- and intersectorial links of the TPK's. It is precisely these links which are a determining factor of the rational organization of production. Through them optimal proportions of production and purposeful specialization of the economy may be secured.

It seems necessary, first of all, to justify the system of indicators and forms of the plan of the TPK's, taking into consideration their place in the system of national economic planning. Secondly, to determine the procedure for the elaboration of comprehensive plans for the TPK's. Thirdly, to secure the correct mutual

coordination of the questions connected with the perfection of the sectorial production plants in the general structure of the economy of the TPK's.

In this direction certain steps forward have already been taken. Thus, in the plans of the union republics it is envisaged to single out the tasks in regard to the development of the TPK's. Among the indicators it is the volume of output of industrial production in natural expression and in comparable prices for every ministry and department, and also indicators characterizing capital construction, labor resources and the efficiency of production. The central part of the plan for TPK's is composed of tasks regarding the development of the sectors of material production, where indicators of the development of the enterprises of the production infrastructure--regarding the output of production for intersectorial purposes, construction materials, and electric and heat energy--are particularly singled out. Our scientific elaborations testify to the fact that the development of the economy of the TPK's must be characterized also with the aid of summary indicators of specialization and that the proportions and indicators of the production and social and everyday services infrastructure must be reflected in the plan. Of fundamental significance is the correct planning of the enterprises and organizations of the sectors of the nonproductive sphere not only for the TPK as a whole, but also for every settlement.

It seems necessary that the five-year-plan and the annual plans for the development of the TPK include a clear characterization of the territorial and departmental structure of the complex. It must be supplemented by indicators of the use of land, mineral and raw material, and labor resources.

For the effective development of the TPK, the planning of mutually coordinated and balanced functioning of all sectors of the economy must be substantiated by calculations of the growth of production efficiency.

Experience shows the expediency of the creation of technical-economic councils which are attached to the local party and soviet organs and which work on a national basis. Such councils help secure a coordinated solution of the problems of the development of the sectors of the TPK.

The elaborations of the Gosplan of the republic and its economic institute with respect to the development of the TPK are carried out with the active participation of the party organizations, union and republic ministries and departments take part in them, as do the largest scientific and design institutions and hundreds of enterprises. The head organization is our institute, which exercises scientific and methodological guidance of the research and prepares recommendations which are then discussed by the collegium of the Gosplan.

The recommendations that are adopted are sent to all directive organizations of the republic. All this makes it possible to make a significant advance in the practical questions of the formation and development of the TPK. Oblast-level party, soviet and economic organizations take part in their solution, which reinforces the practical direction of the elaborations and makes it possible to avoid departmental isolation.

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## INTRODUCTION OF NEW TECHNOLOGY

### USING, AUGMENTING PLANT AND EQUIPMENT EFFICIENTLY

Moscow EKONOMICHESKAYA GAZETA in Russian No 45, Nov 81 pp 11-14

[Material by EKONOMICHESKAYA GAZETA for use in courses in the system of economics education: "Aid to Course Instructors and Students in the System of Economics Education"]

[Text] In the 1981-1982 academic year widespread study of new courses will begin in the system of economics education: "Thrift--A Communist Trait" (for workers and kolkhoz members) and "The Economical Economy" (for specialists and supervisory personnel). These courses are being given to the workers in accordance with the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Stepping Up the Effort Toward Economical and Efficient Use of Raw Materials, Fuel and Energy, and Other Physical Resources." Course materials for the study of relevant topics are being published regularly in EKONOMICHESKAYA GAZETA as an aid to course instructors and students (see the special supplements in Nos 39, 41 and 43). In this issue of the newspaper, No 45, material is being published on the topics "Efficient Use of Machine Tools, Equipment and Machines" and "Efficient Use of Fixed Capital and Capital Investments." Publication of material on subject matter and methods to help those taking the new courses will continue.

#### Efficient Utilization of Equipment

Improved use of production capacities--machines, equipment and transport facilities--is opening up important opportunities. Reduction of idle time, raising the shift coefficient, and devising flowcharts that save on energy and materials--this is where efforts are to be concentrated.

From L. I. Brezhnev's address at  
the 26th CPSU Congress

One of the basic ways of intensifying production and of increasing output at lower inputs of labor, material and financial resources is the optimum use of

fixed productive capital. It reflects the productive capacity per worker and, consequently, the potential for the rise of labor productivity and for augmentation of the scale of production.

Fixed productive capital consists of machines, equipment, instruments, tools, attachments, production buildings and installations, and transportation equipment. It is clear that a special role is played by the active part of capital--equipment, the implements of labor, which determine the maximum possible volume of output by the section, the shop, or the enterprise, that is, their production capacity.

V. I. Lenin repeatedly emphasized the necessity of using the most up-to-date equipment and of placing industry, agriculture and transportation on an up-to-date technical footing. "More machines have to be introduced everywhere and the transition made to machine technology as broadly as possible," Vladimir Il'ich said in 1920 in his address at the Seventh All-Russian Congress of Soviets (Vol 42, p 153). He associated success in the building of communism with reorganization of the national economy on the basis of the most recent advances of science and technology: "We know that communist society cannot be built unless industry and agriculture are reborn, and that rebirth must not be after the old pattern. They need to be rebuilt on a modern foundation constructed according to the last word in science" (Vol 41, p 307).

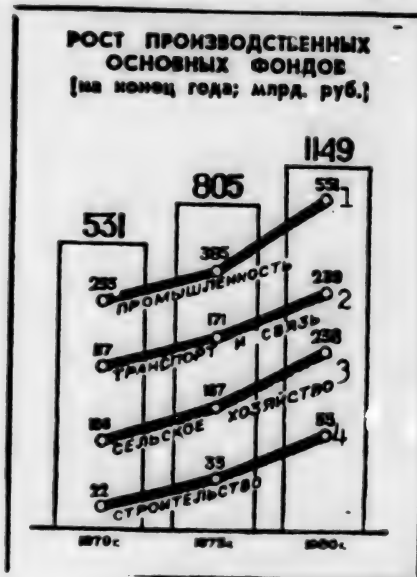
A huge production potential has been built up through the effort of the Soviet people by carrying out Lenin's GOELRO [State Commission for Electrification of Russia] Plan, by accomplishing socialist industrialization, and by performing the formidable construction program of ten 5-year plans. In 1980 its most important part--fixed productive capital--was 42-fold greater than in 1913 for the national economy as a whole.

At the outset of 1981, as can be seen from the following figure, it amounted to 1,149 billion rubles. The value of fixed productive capital in the industrial sector had reached 551 billion rubles, in transportation and communications it was 239 billion, in agriculture 238 billion, and in construction 55 billion rubles. In the other sectors of the sphere of material production it totaled 66 billion rubles.

During the last decade a particularly extensive program of projects was carried out to reequip all sectors of the economy. Fixed productive capital in the economy grew 2.2-fold during the seventies. This means that the production potential built during the Ninth and Tenth 5-Year Plans was equal to that built over the entire previous period of socialist construction.

More than 3,000 major new state industrial enterprises went into operation during those 10 years. At tens of thousands of existing enterprises facilities underwent expansion and reconstruction on an up-to-date technical basis. The physical production capability of agriculture, which is conforming increasingly to an industrial pattern, was bolstered considerably. During the Ninth and Tenth 5-Year Plans agriculture received 3.5 million tractors and 2.4 million trucks as well as other equipment. Much was done to develop and improve the

technical capability of construction, of transportation and communications, and of enterprises in the sector of trade and consumer services.



Growth of Basic Production Capital, in Billions of rubles as of the year's end

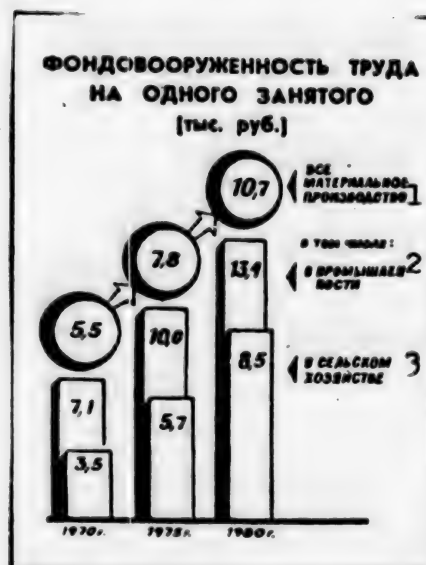
Key: 1. Industry 3. Agriculture  
2. Transportation and communications 4. Construction

Industrial giants like the Sayano-Shushenskaya GES, which is the country's largest with a capacity of 6.4 million kw, the Bogatyr' strip mine in Ekibastuz with a capacity of 50 million tons of coal per year, the Volga and Kama motor vehicle plants, and the Leningradskaya AES, with a capacity of 4 million kw, are examples of modern production based on recent advances in science and technology.

Whereas in 1970 the average fixed capital per worker in the industrial sector was 7,100 rubles, in 1980 it was 13,400 rubles. This means that the capital-labor ratio nearly doubled during the decade. In agriculture the capital-labor ratio increased more than 2.4-fold over the same period and reached 8,500 rubles, while in construction it rose 2.2-fold and reached 4,400 rubles.

The rise of production capacity per worker has been the basis for a rise in labor productivity. In 1980 the productivity of social labor was nearly 1.5-fold higher than in 1970. At the same time a comparison of these figures shows that the rise of labor productivity has been lagging behind the rise of output capacity per worker.

The 26th CPSU Congress set the task of fuller and more efficient utilization of production potential. Particular attention is to be paid in the eighties to increasing the output from existing fixed capital in all sectors of the economy and to faster attainment of rated capacity at projects put into production. Emphasis has been put on renewal of the technical basis of production through retooling and reconstruction. There is to be a corresponding change in the proportional distribution of capital investments.



Capital-Labor Ratio,  
in thousands of rubles

Key: 1. Material production as a whole      3. Agriculture alone  
2. Industry alone

As emphasized in the Basic Directions for the country's economic and social development, a decision has been made to commence construction of new enterprises and expansion of existing ones only in cases when the economy's needs for the given product cannot be met by improved use of production capacities, assuming that they undergo reconstruction and are reequipped.

Over the 5-year period as a whole fixed productive capital will increase more than 1.3-fold. There is to be a considerable strengthening and renewal of the production capability of the branches of the fuel and energy complex, machine-building, ferrous metallurgy, transportation, the agroindustrial complex, and enterprises for production of consumer goods.

The experience of advanced associations demonstrates that full utilization of existing technology and maximum load on equipment yield a large economic benefit. If, on the other hand, powerful up-to-date equipment stands idle or is poorly utilized, this means that the labor and funds extended to build it are immobilized. Direct damage is thereby inflicted on society and the country's economy. Efficient and optimum utilization of equipment is directly related to inculcating the communist attitude toward, economy and thrift.

"Plants and mines, blast furnaces and machines, instruments and the newest automatic machines--everything we refer to when we say productive capital--this constitutes the enormous wealth of the people. But we have to know how to really utilize that wealth effectively," L. I. Brezhnev said in his speech to workers of the Motor Vehicle Plant imeni Likhachev. "Without straightforward scientific management, without proper planning and good management, without increased responsibility on the part of all workers--from the captains of industry to operatives--this wealth will not yield the return we have a right to expect."

## Potential for Raising the Output-Capital Ratio

Implement measures aimed at raising the output-capital ratio in the sectors of the economy, in associations and in enterprises.

More optimum use of production capacities, broader introduction of highly productive equipment, and improvement of the structure and timely renewal of existing fixed capital.

Excerpt from the Basic Directions for the Economic and Social Development of the USSR Over the Period of 1981-1985 and up to the Year 1990, adopted by the 26th CPSU Congress

The output-capital ratio is the most important indicator reflecting the utilization of fixed productive capital.

For the national economy as a whole and for the union republics this indicator represents the volume of national income per ruble of the average annual value of fixed productive capital.

In the industrial sector and in associations and enterprises the output-capital ratio is defined in terms of the volume of product output per ruble of the average annual value of capital. In branches and at enterprises where many different products are produced, the output-capital ratio is calculated according to the volume of output in money terms.

When the output-capital ratio is being evaluated in terms of gross or commodity output there may be a great variation in its absolute value from branch to branch and from enterprise to enterprise. For example, at enterprises in the electric power industry the output-capital ratio is 20-30 kopecks, while at enterprises in light industry and the food industry it is several rubles. As a rule this depends on the inputs of raw materials, supplies and fuel required to produce the product. In those production operations where more expensive raw materials are consumed in manufacturing the product, the volume of commodity output will also, of course, be larger, and that means that the output-capital ratio will also be higher. That is why it is not possible to compare enterprises on the basis of the absolute value of the output-capital ratio when the calculation is made in terms of gross or commodity output. In this case its dynamic pattern is looked at (a comparison is made to the previous period or to the plan).

For example, if some enterprise had commodity output of 2 rubles in 1975 and 2 rubles 20 kopecks in 1980 for every ruble of its fixed productive capital, then the output-capital ratio rose 10 percent.

Let us assume that over the same period the output-capital ratio at some other enterprise increased from 3 rubles to 3 rubles 3 kopecks, then that is an increase of 1 percent. It is evident from this that the first enterprise improved the utilization of its capital to a greater degree than the second, though the absolute value of the output-capital ratio was higher at the latter enterprise.

As the transition is made to assessing the volume of production in terms of normative net output, the output-capital index is determined in terms of normative net output. In this case enterprises can be compared to one another with respect to the absolute value of the output-capital ratio. This makes it possible to evaluate more correctly the efficiency of utilization of fixed productive capital. In enterprises and production sections manufacturing the same product the output of equipment can be determined in physical terms--in tons of coal mined or petroleum extracted or steel smelted.

Many factors influence the value and dynamic behavior of the output-capital ratio, and often they do not depend on the enterprise's work force. For example, in the extractive industries these include the mining-geology conditions for the mining of minerals. In all sectors the value of the output-capital ratio is affected by the value and productivity of newly introduced fixed productive capital. But the main thing here, of course, is the level of utilization of existing capital.

The intensive strategy of economic management indeed specifically presupposes a systematic rise of the output-capital ratio at existing enterprises. This is confirmed by the examples of many work collectives.

For instance, thanks to reconstruction and the reequipping of shops at the Magnitogorsk Metallurgical Combine the volume of iron smelted over the last two 5-year periods increased 1.4 million tons and the volume of steel produced 2.9 million tons. Even though several large and expensive facilities were built, the output-capital ratio at the combine did not drop. The Magnitogorsk workers spent on reconstruction between two-fifths and one-half for the production of each ton of pig iron, steel and rolled products what would have been required to build new capacities.

At the Vitebsk Monolit Association the output-capital ratio rose 16.2 percent during the years of the 10th Five-Year Plan.

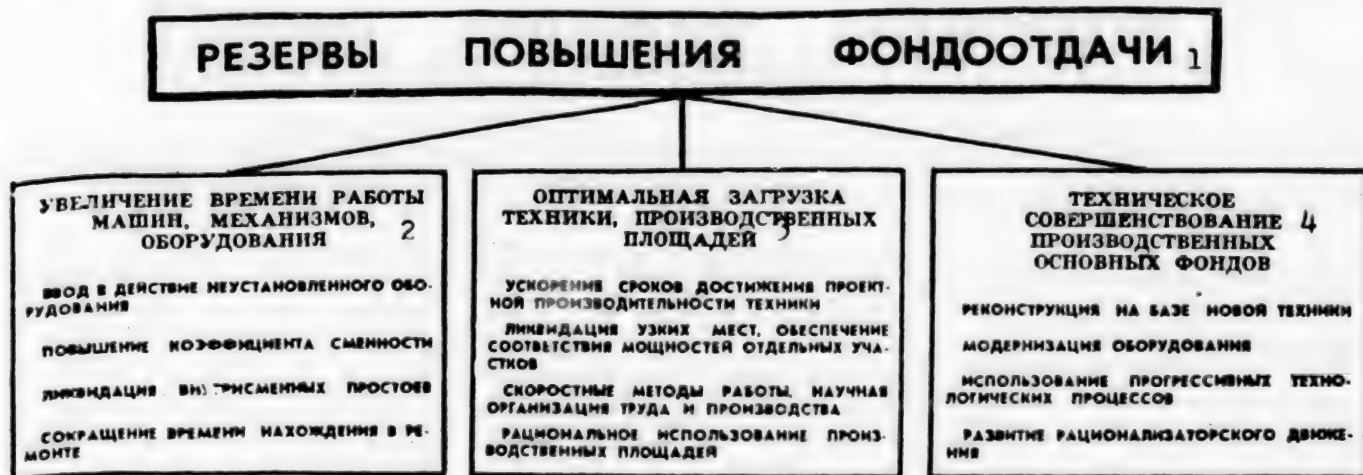
Machinebuilders in Leningrad, Sumy and Zaporozh'ye, metallurgists and miners in the Kuzbass, oil field workers in Tataria, construction workers in Orel and Tallinn, and kolkhoz and sovkhos workers who have applied the experience of the Ipatovskiy machine operators, have achieved a high return on fixed capital.

There are at the same time quite a few enterprises where this indicator is being allowed to drop. For instance, equipment is being renewed at the Volgograd Pole Impregnation Plant. But its enlarged capacities are not being fully utilized. In 1980 the output-capital ratio was only 92 kopecks, whereas in 1975 it was 3 rubles 45 kopecks.

The output-capital ratio is a summary indicator of utilization of fixed productive capital. A whole number of other indicators can be used to describe utilization of the various elements of capital, depending on the specific nature of the production sector.

Much attention has been paid to the output-capital ratio as an indicator in the measures to improve the economic mechanism. This indicator is becoming one of the principal ones related to building up material incentive funds. The rates of deductions to material incentive funds of enterprises and associations are as a rule increased by a factor of 1.5 for counterplans exceeding the assignments of the reference figures for the relevant year of the 5-year plan with respect to the rise of the output-capital ratio.

A 1-percent increase in output per ruble of fixed productive capital in the industrial sector signifies at the present time a growth of production of industrial products amounting to approximately 6 billion rubles, and if the calculation is made for the year 1985, it would be 8 billion rubles.



- Key:
1. Potential for raising the output-capital ratio
  2. Increasing the operating time of machines, machinery and equipment: activation of equipment which has not been installed; raising the shift coefficient; elimination of idle time lasting less than one shift; reduction of repair time
  3. Optimal load on equipment and production areas: faster times for attainment of the rated productivity of equipment; elimination of bottlenecks and matching the capacities of individual sections; high-speed methods of operation, scientific management and scientific organization of production; optimum utilization of production areas
  4. Technical improvement of fixed productive capital: reconstruction based on new technology; modernization of equipment; use of progressive process technologies; development of the production innovators' movement

There is unused potential in every sector of the economy and in every enterprise and section for stepping up the rise of the output-capital ratio and for improved utilization of equipment. The principal ways of raising the output-capital ratio are indicated in the chart. We will examine them in some detail.

#### Increasing the Operating Time of Machines, Machinery and Equipment

If productive capital is to be used more efficiently and the output-capital ratio raised, the first thing that needs to be done is to see that machines, equipment and machine tools operate as many hours as possible. First of all, existing equipment needs to be put into operation more rapidly. After all, what is sometimes happening? An enterprise acquires a new machine tool, but for a long time it does not put it into operation. In another case some machine tool is not needed in a given shop, though it could operate usefully somewhere else.

The value of uninstalled equipment runs to millions of rubles in every branch. Not only does it fail to yield any return whatsoever, but not uncommonly it deteriorates because of poor storage, it breaks down, and it becomes obsolete. All of this results in large losses for the national economy. It has been calculated that if all the uninstalled equipment were used at full capacity in the industrial sector, this would afford an additional output worth approximately 20-25 billion rubles.

Raising the shift coefficient is a very important potential that could be used for raising the output-capital ratio. This coefficient is defined as the ratio of the number of machine-shifts (or machine-hours) worked per day divided by the total number of machine tools (complexes made up of standard machine units, or machines) assigned to the enterprise, to the shop or to the section.

In those branches which have continuous production--metallurgy and chemistry, for example--the main processing equipment usually operates around the clock. As a rule the shift coefficient is high at enterprises in the textile industry.

Yet in machinebuilding, where 25-30 percent of all the machines and equipment that exist in the industrial sector are concentrated, the shift coefficient is approximately 1.4. After all, this means that on the average the equipment is operating only 10-11 hours per day.

The rise of the shift coefficient targeted in the 11th Five-Year Plan for machinebuilding is to approximately 1.6--an average increase of 15 percent. And this is altogether realistic.

We might cite as an example the efficient utilization of equipment at machinebuilding enterprises in Leningrad, where in 1980 the shift coefficient was 1.5, having risen from 1.29 for metal-working equipment in the principal production operation during the 10th Five-Year Plan.

Up-to-date models of equipment there have been put on a full two-shift operating schedule. The shift coefficient of mechanized and automatic production lines was 1.9 and 2, respectively, that of casting equipment 1.77, and that of forging and pressing machines, which are used in three shifts, 2.78.

Elimination of downtime lasting less than one shift can be a very important source of a rise of the output-capital ratio. In metallurgy, for example, where on the whole equipment is used intensively, average current downtime of blast furnaces even increased from 1 percent of the nominal scheduled time in 1970 to 1.9 percent in 1980. Over the 10-year period the downtime of open-hearth furnaces was all of 9-10 percent of the available calendar time.

The first thing that has to be done to eliminate or at least considerably reduce downtime is to efficiently organize the supply of raw materials, supplies and workpieces to every work station. Efficiently organized supply is a most important factor in eliminating idle time. Another important factor is strengthening work discipline and technological discipline. Not a single minute of work time should be lost.

Over 8 months of this year 3,883 man-days were lost at the Kirovograd Krasnaya Zvezda Machinebuilding Plant because of absenteeism. That is the amount of work time it usually takes the plant to manufacture 240 grain planters.

After all, at a modern enterprise absenteeism causes a chain reaction of downtime of machines, equipment and transportation facilities in related sections and shops.

Experience shows that the level of discipline is far higher in work teams working according to a single job contract, where the coefficient of work participation is taken into account in evaluating and remunerating every member of the team. For example, in work teams at the Khar'kov Tractor Plant absenteeism and work time losses are barely half what they are in the rest of the enterprise's work force.

One of the shortest workweeks [in the world] has been established in our country. But this is for the people, not for the machines. The equipment should operate the maximum number of days possible. How do matters stand at present with the load on equipment in terms of time? In continuous production the number of workdays is usually less than 260. That means that the equipment is standing idle almost 1 day out of 3.

In many production sections the operating time of equipment could be increased by introducing a continuous workweek with a staggered schedule of days off for the workers and by developing the movement of operators operating more than one machine. This is, of course, no simple matter. Many factors have to be taken into account, social factors in particular. But the benefit from this measure is very great.

And finally, the operating time of machines and machinery can be increased by reducing repair time. The system of scheduled preventive repair is in effect at our enterprises. This means that every machine is withdrawn for repairs at strictly defined intervals in terms of its operating time. Scheduled preventive repairs avert breakage and breakdowns. At the same time, machine operating time between repairs can be lengthened appreciably if the crucial assemblies are improved on the basis of advances in technology and scientific data on friction

and wear. Skillful handling of the machine, concern for taking care of it and protecting it against corrosion are quite important.

The collective of the Kremenchug Motor Vehicle Plant increased the distance traveled by the KrAZ vehicle before a major overhaul to 180,000 km. During the 10th Five-Year Plan alone the economic benefit exceeded 200 million rubles. This is equivalent to producing another 23,000 vehicles of that class.

Progressive workers are lengthening the interval between repairs by operating equipment correctly, by taking care of it, and by adopting a thrifty attitude toward every machine tool and machine. The movement to increase the distance traveled between repairs has become widespread at advanced enterprises in motor vehicle transport.

It is also important to improve the organization of repairs and to put it on an industrial basis. That means that every enterprise manufacturing equipment must manufacture a sufficient amount of spare parts. Then the enterprise operating the equipment will not be forced to make the spare parts itself, sometimes by primitive methods, involving large inputs of time and labor. And, of course, everything should above all be done to develop guaranteed repairs of equipment.

#### Optimal Load on Equipment and Production Areas

Increasing the operating time of equipment does not exhaust all the possibilities for raising the output-capital ratio. It is important that every piece of equipment operate productively, under a full load.

A high and constantly rising load on equipment is characteristic of the USSR economy. For example, the average daily yield of steel per square meter of floor area increased from 9.15 tons in 1970 to 9.30 tons in 1980. At the same time this indicator is considerably higher at progressive enterprises.

The hourly output of rotary cement furnaces increased from 25.3 tons in 1970 to 33.1 tons in 1980. The table below shows the rise in utilization of equipment in the cotton industry:

	<u>1970</u>	<u>1975</u>	<u>1980</u>
Output of yarn per 1,000 spindles per hour (kilogram-numbers)	745	770	842
Output of unbleached fabrics per loom per hour (in weft-meters)	10,613	11,273	12,277

It is extremely important to increase the load on transportation equipment. For example, the productivity of trucks per average registered truck-ton rose from 1,749 tons in 1970 to 1,918 tons in 1980 (this indicator is determined by dividing the tons of freight carried by the total carrying capacity of the average number of trucks registered).

Efficient use of capital depends in large part on the time it takes to attain the rated productivity of equipment and the capacity of every project put into operation.

When our society invests sizable labor and physical resources to build new capacities, it is interested in attaining the fastest return from them. This necessitates adoption of the course toward intensification of social production. For example, an improvement of only 1 percent in utilization of the production capacities of Moscow's industries yields on today's scale an additional output worth hundreds of millions of rubles and at the same time signifies a saving of about 58 million rubles on capital investments.

In 1974 new standards were put into effect concerning the time allowed for attaining rated capacity at newly introduced enterprises; the new standard allowances were 20-30 percent shorter than the ones previously in effect. But even they are still quite long. As a matter of fact the time required to attain rated capacity at new enterprises now averages approximately 3 years. This means that at any given moment approximately 30 percent of all industrial productive capital is not operating at the rated output-capital ratio.

In our industrial sector there are notable examples where new projects are built and rated capacities attained ahead of schedule. Let us take No 6 blast furnace at the Novolipetskiy Metallurgical Plant, which has a capacity of 3,200 cubic meters. This furnace was put into operation on the eve of the 61st anniversary of the October Revolution, 54 days ahead of the scheduled date. The design and construction and the manufacture, installation and adjustment of equipment were accomplished in record time--22 months.

The furnace was brought up to design capacity in 5 months after it went into operation (instead of the half year allowed by the standard). But already in 1980 it yielded 2.56 million tons of pig iron--16 percent more than rated capacity. The total economic benefit obtained from use of progressive innovations and ahead-of-schedule initial operation of the furnace and attainment of its rated capacity amounted to about 21 million rubles. The furnace has become the best in the branch with respect to the principal technical-and-economic indicators.

The initiative of progressive collectives in Rostovskaya Oblast for ahead-of-schedule attainment of rated capacity, which has been approved by the CPSU Central Committee, has great importance. The movement of the people from Rostov under the slogan "Let us build ahead of schedule--let us attain rated capacity ahead of schedule" has won support in many regions of the country.

This movement is yielding a large economic benefit. The specialized tools and production gear plant of the Rostsel'mash Production Association, for example, was built in 26 months, while the standard allowed construction time was 27 months. The economic benefit from shortening the construction time was 67,000 rubles. The standards allowed 18 months to attain rated capacity in the production facilities which were built. In actuality the plant achieved design capacity in 17 months. This made it possible to produce additional output worth 120,000 rubles.

The experience of progressive collectives shows that it is important to furnish raw materials and supplies in good time to every new project put into operation. Rapid attainment of rated capacity of facilities put into operation also depends on timely preparation of qualified operating personnel. And since a large number of young people are coming into the workplace, consideration needs to be given to the fact that the best school for them is to participate in installation work and startup and adjustment work. All of this makes it possible not only to stay within the time allowed, but even to attain the rated productivity of equipment ahead of schedule.

At every project which is in the stage of attaining rated capacity a thorough study needs to be made of the causes holding back attainment of the rated output, and specific measures should be drafted whose implementation will make it possible to achieve that capacity within the shortest period of time.

A patriotic movement under the slogan "Rated productivity in every processing complex and unit" has taken on large proportions at enterprises in Pavlodarskaya Oblast.

A maximum load on all equipment that is available in the enterprise or shop can be achieved only if bottlenecks are eliminated and the capacities of individual sections are matched to one another. What are bottlenecks, and where do they come from? After all, every enterprise or shop is designed and built to manufacture a product whose production is characterized by a particular proportional pattern in the labor intensiveness of various operations. It is indeed on that basis that the makeup of equipment is arrived at--so many lathes, so many milling machines, and so on. But in time the need arises to manufacture other products which have a different proportional pattern of labor intensiveness. The stock of machine tools no longer conforms to that pattern. It may happen, for example, that there are fewer lathes than necessary to manufacture the new products, but more milling machines than necessary. In this case the lathe group of machine tools becomes a bottleneck. The lathes may operate on three shifts, while the milling machines stand idle for a large portion of the time.

What is to be done in this case? First of all, lathing must be organized as efficiently as possible, cutting speeds have to be increased, and the shop needs to be supplied workpieces of optimum dimensions as close as possible to the finished article. Not infrequently it is necessary to install additional lathes. That is what it means to eliminate a bottleneck, that is, to match the capacities of particular sections.

At the Shchekino Chemical Combine equalizing the capacities of the various subdivisions and eliminating bottlenecks and disproportions in the traffic capacity of different sections and shops helped to perform the experiment to increase output by raising labor productivity while at the same time reducing the number of personnel.

A thorough analysis was made at the combine of the load on production capacities so as to discover unused potential. Charts were drawn up of the load on combined machine units, installations and other equipment for all the production

operations and products. The charts clearly showed "peaks" and "troughs," indicating disproportions between the traffic capacity of the different sections. An endeavor was made to pull up the lagging sections. Manufacturing processes were also fully automated, and laborious operations were mechanized. Norm setting was at the same time improved, and scientific management was introduced. This made it possible to make maximum use of the capacity of existing equipment and to increase output without adding to the force of operating personnel.

The use of high-speed operating methods and the scientific organization of work and production increases the load on equipment substantially. Examples of high-speed steel smelting and of speeding up processes in chemical and other production operations are well known. All of this ultimately results in better utilization of fixed productive capital. The main thing here is to guarantee smooth operation of every production section. Not uncommonly many machines stand idle in the first 10 days of the month, while in the third 10 days they operate with an excessive load. Yet it would be possible to operate like the work force of the Penza Municipal Service Machinebuilding Plant, which for more than 10 years in succession has not only been fulfilling all its plans, but has also achieved a smooth rhythm--one-third of the monthly program is manufactured and sold in each of the three 10-day periods.

Sound preparation was, of course, required for this. What did they do at the plant? They introduced a system of remuneration based on the end product, they organized mixed work teams, and the workers mastered two or three related occupations.

The mixed start-to-finish work teams, made up of workers who work on several shifts, help considerably to increase the efficiency of utilization of equipment. They include workers in different specialties. Their work is evaluated on the basis of the end result--output of the finished product. That is why interchangeability and combination of occupations have been widely developed in these work teams. In order to save time one shift turns equipment over to the next one, so to speak, on the run.

Improved utilization of production space is quite important to increasing the return on capital. First of all, the portion of work space occupied by equipment needs to be constantly increased. This is achieved by the most compact location of all the other production services. Second, the equipment itself needs to be optimally located, and the share of the active part of equipment needs to be increased in those same areas. On the one hand this brings about a saving on capital investments, while on the other it makes it possible to increase output per ruble of fixed productive capital. This, of course, has to be achieved without detracting from working conditions or the preservation of equipment. The following reconstruction project was carried out at the Krasnoyarsk Milk Processing Plant in order to improve utilization of production areas: the plant's main building was joined to the refrigeration facility. This made it possible to locate in the previous space an additional four flowlines for filling bottles and six automatic machines. As a result output doubled in the same work space. The expenditure for the reconstruction project was 800,000 rubles. Construction of a new plant with the same capacity would have cost 8 million rubles.

The farms in Tarashchanskiy Rayon in Kiyevskaya Oblast have gained good experience in optimum utilization of space in livestock-raising projects. When a plan was being drafted on the rayon's kolkhozes for intensification of specialization and concentration in livestock raising, a decision was made not to build new complexes, but to use the existing livestock-raising facilities. Their reconstruction was carried out on the scale of the entire rayon. It took only 2 years to add the capacity in terms of the animals that can be kept which would have taken 5-6 years if new complexes were built. The time required to achieve the planned level of production of milk, meat and eggs in the rayon was cut in half thanks to reconstruction of the livestock farms. The kolkhozes saved more than 5 million rubles.

These and other examples demonstrate that the load on equipment and production space can be increased considerably when a motivated and stewardly attitude is taken toward the effort, toward optimum use of equipment. The need for capital investments is consequently reduced, and output of products the country needs increases more rapidly.

#### Technical Improvement of Fixed Productive Capital

One of the major sources of a rise in the output-capital ratio is raising the technical level of capital assets.

Capital assets can be technically improved through reconstruction of the existing production operation on the basis of new technology. The faster outdated equipment is replaced by new and more efficient equipment, the larger the increase in output and the rise in the efficiency of social production.

Stock of Basic Machines in Agriculture, as of the end of the year, in thousands of units

<u>Machines</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
Tractors	1,977	2,334	2,562
Grain-harvesting combines	623	680	722
Trucks	1,136	1,396	1,596

Soviet industry is typified by rapid renewal of fixed productive capital. During the 10th Five-Year Plan 36 percent of fixed productive capital in the industrial sector was renewed, including a figure of 41 percent in the fuel industry, the chemical and petrochemical industry, machinebuilding and metal manufacturing. This renewal is achieved both by virtue of new construction and also by replacement of outdated equipment by new equipment. Yet there are also cases when new machine tools and machines are underutilized, while the old ones are loaded to the limit, though the latter operate less effectively--labor productivity is lower, the costs of raw materials are higher, and product quality is not as good. There is consequently a need to reassess the assignment of workers and above all to seek out opportunities for full utilization of up-to-date equipment.

Modernization of Production Equipment in the Industrial Sector, in thousands of units

	<u>1971-1975</u>	<u>1976-1980</u>
Modernization of production equipment--total	732.0	812.0
Including:		
Ferrous metallurgy	11.8	15.0
Chemical and petrochemical industry	34.5	35.3
Machinebuilding and metal manufacturing	166.0	177.0
Building materials industry	18.0	22.1
Light industry	372.0	423.0
Food industry	36.3	39.9

At the same time faster replacement need not be expedited for all equipment. The technical level and productivity of many machines and much equipment can be raised through modernization, that is, through partial improvement and by replacement of individual parts and assemblies. This is a very economical way of improving capital assets. A substantial rise in the productivity of equipment can be achieved at the most negligible cost.

In many branches of industry modernization is combined with general overhaul, which yields a sizable benefit. A sample analysis of the results of 450 cases of major overhaul of processing units at petroleum refineries showed that modernization was done along with general overhaul in 221 cases (53 percent). The same approach is taken in ferrous metallurgy with the modernization or expansion of blast- and open-hearth furnaces and in the building materials industry.

A substantial improvement in the utilization of fixed productive capital can be achieved by using progressive process technologies. In ferrous metallurgy, for example, they include the oxygen converter method of steelmaking, in the chemical industry the use of catalysts that speed up the production process, in machinebuilding the introduction of high-speed cutting methods and the use of laser and ultrasonic technology. The importance of progressive process technologies has been discussed in the supplement "To Advanced Frontiers in Science and Technology," published in No 41 of *EKONOMICHESKAYA GAZETA*.

The movement of production innovators is expanding every year in our country. Moreover, a sizable portion of proposals for production innovations results in a higher yield of equipment and productive capital. The efforts of many, many thousands of production innovators are aimed at improving the designs of machines and equipment, at increasing their output, at improving the organization of production, and at improving the working conditions of the workers.

In the final analysis the level of utilization of fixed productive capital depends on the people who are using those assets. The output of every machine tool, of every machine, and of our country's entire productive potential in the interests of a growth of its economic might and greater prosperity of the Soviet people depends on their ability and resourcefulness, on their technical creativity, and on their stewardly attitude toward equipment.

Wide dissemination of progressive production know-how is an extremely large source for raising the output-capital ratio and for increasing product output.

Stock of Principal Machines in Construction, as of the end of the year, in thousands of units

	<u>1970</u>	<u>1975</u>	<u>1980</u>
Excavators	103.3	140.3	164.0
Scrapers	29.2	41.1	43.6
Bulldozers	101.7	141.7	161.5
Mobile cranes	118.8	166.6	208.0

#### Applying the Know-How of Production Innovators

In the Basic Directions of the country's economic and social direction emphasis was put on the need to ensure timely summarization and planned dissemination of progressive know-how in the conduct of economic activity so that it becomes the property of all work collectives.

In every branch there is abundant know-how concerning better utilization of fixed productive capital; progressive collectives and workers achieve figures for utilization of equipment that far exceed the branch average. For instance, at the Sumy Machinebuilding Association imeni M. Frunze a system was worked out for management of production capacities. The coefficient of utilization of the capacity of every machine, every section, and every shop began to be taken into account when results were totaled up for the competition and for the awarding of bonuses.

When economic incentive funds are being distributed, preference is given to funds for those collectives of sections and shops which are making better use of production capacities. Foremen and workers have become more motivated to put a full load on machines, to reduce downtime, and to identify equipment that is being poorly utilized. As a result the Sumy machinebuilders managed to save 11.5 million rubles on capital investments in the years of the 10th Five-Year Plan.

The know-how of progressive leaders who achieve full utilization of the capacities of construction equipment and who reduce its idle time has great importance in construction.

Work team leader M. Semin, holder of the USSR State Prize and a delegate to the 26th CPSU Congress, has for 17 years headed the excavator crew in the Sibakademstroy Construction Administration. The E-652 excavator, with which the crew operates, has had practically no idleness from breakdowns. The excavator operators know quite well that every hour the machine is idle means that 65 cubic meters of earth has not been moved. Time for repairs and preventive inspections has been reduced to a minimum. The intervals between general overhauls of the machine have been extended 1.5-fold over the standard time. As a rule the intervals between shifts are used for prevention.

In 9 months of 1981 the crew fulfilled its annual planning target and moved more than 230,000 cubic meters of earth. They decided to move at least another 66,000 cubic meters by the end of the year. A school for advanced know-how was organized for the entire branch around M. Semin's crew.

In railroad transportation the railroad workers of Moscow, who were the initiators of a competition to increase the weight and length of freight trains, have built up valuable know-how in the efficient use of rolling stock. In collaboration with scientists, engineering and technical personnel and production front-rankers of the Moscow Railroad developed and applied a new technology for making up and driving heavy freight trains, making use of the know-how of the best engine drivers and new principles for organizing the nonstop movement of heavy trains within sections and over entire routes.

Freight train weight was first increased to 6,000 tons with a train length of 25 cars, and then to 10,000 tons in one of the sections. This made it possible to substantially increase the traffic capacity of the main line. More than 160 million tons of freight have been carried in heavy trains over the last 2 years.

Another valuable initiative of railroad workers has been the comprehensive system for efficient car use developed and introduced at enterprises in L'vovskaya Oblast. A new indicator, the "car-hour," was introduced there. For example, if an enterprise is allotted 200 cars under the plan for monthly product shipments, and the time allowed for their standing on the siding of that enterprise is 3 hours, then it is allotted 600 planned car-hours. If an enterprise achieves a saving on car-hours, it is given priority in obtaining cars to ship its products. Widespread application of this know-how will make it possible to save 20 percent on car turnaround time.

Organization of comprehensive use of equipment after the pattern of machine operators in Ipatovskiy Rayon in Stavropol'skiy Kray is spreading everywhere in agriculture. The essence of the Ipatovskiy method, which field crop workers use in harvesting the crop and in other farming operations, consists of making up mixed groups of machines consisting of a certain number of combines, trucks, and units for technical servicing and work crew facilities. The harvest-transport teams, for example, set up on a flow-line basis the entire cycle of technical operations of gathering and transporting the harvest, of cleaning straw from the fields and of breaking up the stubble. The operating plans are drafted so that the combines can be unloaded on the run and to reduce the distances they travel when they are not harvesting the crop. During the current year the average daily threshing yield per combine has been 425 quintals, while the standard quota is 353.

The know-how of workers who have won the State Prize for outstanding achievements in their work and whose work performance indicators considerably exceed the average level of their branch needs to be studied and applied everywhere.

## Efficiency of Capital Investments

Increasing the efficiency of capital construction, carrying out its industrialization in a consistent way, achieving qualitative improvement of fixed capital and faster activation and attainment of rated capacity of production facilities, and speeding up the reconstruction of existing enterprises.

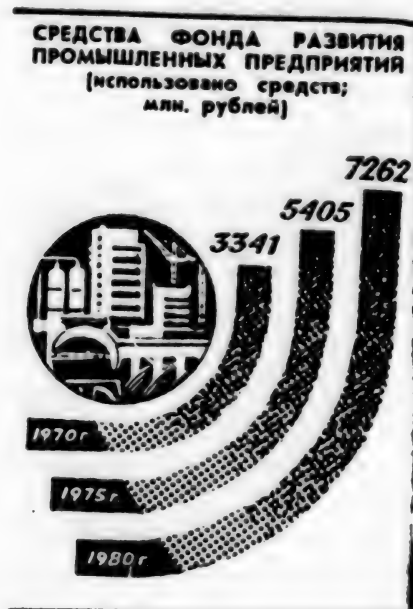
Excerpt from the Basic Directions for the Economic and Social Development of the USSR Over the Period of 1981-1985 and up to the Year 1990, adopted by the 26th CPSU Congress

Fixed productive capital has been growing continuously and undergoing renewal in all sectors of our country's social production. Huge amounts of capital investments are assigned to these purposes every year. For instance, under the USSR State Budget for 1981 capital investments in the national economy were set at 124.1 billion rubles.

It is important to make effective use of the resources of production development funds for reconstruction, for reequipping production, for replacement of outdated equipment with new and improved equipment, and for elimination of the bottlenecks that exist at enterprises and associations. These funds are formed primarily from profit and appreciation.

As the graph shows, the resources of the production development funds in the industrial sector increased from 3,341 million rubles in 1970 to 7,262 million rubles in 1980.

Resources of the Development Fund of Industrial Enterprises,  
resources used, in millions of rubles



It is an exceedingly important task of every enterprise's work force to make effective use of the resources of the development fund.

Specific capital investments to build up capacities through reconstruction and retooling are on the average in the industrial sector 8-10 percent lower than for new construction (and at certain enterprises 25 percent lower or more).

This kind of efficiency of capital investments for retooling and reconstruction is achieved to a considerable extent through better utilization both of existing production capacities and also of those which are newly introduced. As a matter of fact, in many branches rated capacity is attained at new facilities at existing enterprises in half the time or even less than for new construction.

That is why the Basic Directions for the country's economic and social development have set the task of assigning capital investments first of all to reconstruction and reequipping of enterprises and to completion of construction projects already begun. Reconstruction and retooling afford the possibility of obtaining a growth of production capacities considerably more rapidly and cheaply than through new construction.

This orientation of capital investments has made it possible to substantially increase the share of them spent to expand the active portion of productive capital--equipment. For example, the share of outlays for equipment in the total amount of capital investments for projects intended for production increased from 40 percent in 1970 and 42 percent in 1975 to 46 percent in 1980. As we see, the share of outlays for equipment in capital investments experienced the most intensive increase during the 10th Five-Year Plan.

Capital investments in existing production operations are increasing considerably in the 11th Five-Year Plan. Plans call for assigning about 114 billion rubles of capital investments for technical retooling and reconstruction of enterprises in the 1981-1985 period, which is approximately 30 percent of the ceiling on investments for construction of production plant. This is 23 billion rubles more than was assigned to these purposes during the last 5-year period.

The dominant assignment of capital investments to retooling and reconstruction of existing production operations is not a task confined exclusively to planning agencies or ministries. This is a task which should be performed above all in enterprises, associations and every shop. No one can know better than the workers of the shop which equipment has reached the time of replacement, where bottlenecks need to be eliminated, or how to improve the process technology. And this after all, as has been shown, is what brings about a rise in the return on fixed productive capital.

Thus the initiative in carrying out reconstruction and retooling and in making effective use of capital investments should originate above all with production innovators, specialists and economic managers at all levels. It is they who should be the point men in this effort, taking full advantage of all the opportunities that exist.

The workers in Moscow industry have been conducting a major effort toward efficient utilization of capital investments at existing enterprises. For instance, at the Kompressor Plant an average annual economic benefit of 1.75 million rubles was achieved from a retooling project that cost 2.5 million rubles. Production capacities were created that made it possible for the plant to successfully fulfill the plan and to increase its output for the last 5-year period 1.7-fold along with a partial reduction of staff size. A similar project is being carried out at the Dinamo and Energopribor plants and other enterprises in the capital.

Unfortunately, retooling is not yet effective enough at all enterprises. For example, operation of the Moscow Oktyabr' Association has been unstable since the retooling of its main enterprise. The reason is that the retooling was done only in the weaving and finishing operations, but did not affect the spinning operation, which is regarded as a bottleneck. Thus, the retooling of the individual production operations did not result in an overall rise of the output-capital ratio for the association. This example clearly points up the close relationship between the effective use of capital investments and the load on fixed productive capital.

It is very important to increasing the efficiency of capital investments that they be concentrated on the most important construction projects and that the number of projects under construction at the same time be reduced.

Moscow enterprises have achieved considerable success in this. The total number of projects under construction in the capital as envisaged by annual plans was 5,000 in 1976 and 3,100 in 1980. The number of construction starts dropped from 2,000 in 1976 to 1,000 in 1980. Concentration of the efforts of builders has made it possible to increase the activation of fixed capital. For example, at the city's electrical equipment enterprises, at enterprises of the Ministry of Machinebuilding for Light and Food Industry and Household Appliances, and a number of others activation of fixed capital exceeded the volume of capital investments. This means that there was a reduction in the volume of unfinished construction.

Increasing the effectiveness of capital investments at every enterprise will depend to a considerable degree on successful performance of the measures envisaged by the decree of the CPSU Central Committee and USSR Council of Ministers on improving planning and strengthening the influence of the economic mechanism on production efficiency and work quality, which was adopted in July 1979. It set forth that the planning of capital investments must be inseparably related to planning the utilization of production capacities. No construction is to begin until the maximum possible output from existing capacities has been determined. To that end it was deemed indispensable that balances of production capacities be drawn up everywhere. Production capacity has become the most important basis of the plan.

The new 5-year period, as noted at the 26th party congress, will be an important test for builders. They must build at a high level of quality, efficiency and speed, and they must deliver fully completed projects within the time allowed.

## Analysis of Utilization of Fixed Capital

In the course of the analysis it is advisable to study first the data on the output-capital ratio of the section, the shop and the enterprise.

As we have already said, the output-capital ratio is determined by dividing the volume of output produced by the average annual (average monthly) value of fixed productive capital. In the analysis the output-capital ratio figure is compared to data for a series of reporting periods.

The Novocherkassk Permanent Magnet Plant achieved the following figures for the output-capital ratio during the years of the 10th Five-Year Plan:

Output Per Ruble of Fixed Productive Capital, in rubles and kopecks

1976	1 r 90 k
1977	1 r 83 k
1978	1 r 84 k
1979	1 r 98 k
1980	2 r 08 k

As the figures in the table show, after new equipment was introduced in 1977, the plant showed a somewhat lower output-capital ratio (from 1 ruble 90 kopecks to 1 ruble 83 kopecks, or a drop of 3.7 percent). Then as the equipment was assimilated, the output-capital ratio began to rise, and by the end of the 5-year period it was 2 rubles 0.8 kopecks, which is 9 percent higher than in 1976. The rise of the output-capital ratio was achieved by virtue of measures to raise the productivity of machines and to increase the shift coefficient.

The passports of the shop and work team are an important source of data for analyzing the output-capital ratio. Passports of shops are compiled, for example, in the Sumy Machinebuilding Association. Principal attention is paid in the shop passport to the utilization of fixed productive capital, to the technical level of production and product quality, and to the organization of work and of production. The work of compiling shop passports furnishes an additional impetus to development of initiative and creativity and is helping to identify unused potential within the workplace.

At the Kaluga Turbine Plant they decided to compile a "work team labor passport" for each work team. This document contains the data necessary to substantiate work team plans, to make use of productive potential and for the social development of collectives. The passport contains a list of the manufacturing equipment assigned to the work team, and it shows how it is being utilized.

Equipment and production buildings comprise the largest share of fixed capital for productive purposes. Their optimum use predetermines success in the effort to raise the output-capital ratio.

An analysis of utilization of production space is made by comparing data on output per square meter of production space. The results achieved are usually

compared with the figures of similar enterprises and shops and with the best achievements in order to identify advanced know-how.

Utilization of equipment is characterized by the output per unit of equipment in money terms or in physical terms. The result is compared to standards, to the figures for the past year and to the results of progressive work teams, sections or enterprises. Of course, such a comparison is possible only with respect to equipment of the same kind (for example, in the textile industry, the coal industry or a number of other branches of industry).

A case like this, for example, has been reported in the press. At the Baku Textile Combine the productivity of pneumatic power spinning machines in making No 40 yarn was 1,387 kilogram-numbers per 1,000 hoppers per hour while at the Teykovo Cotton Combine the product yield is 25 percent higher than in Baku. It is not difficult to calculate the amount of additional output the Baku Textile Combine could produce if it used the know-how of the people from Ivanovskaya Oblast.

Other indicators are also used in analysis. For instance, at metallurgical enterprises utilization of blast furnaces is determined from the relationship between the volume of the blast furnace in cubic meters and the number of tons of iron smelted; the indicator of utilization of open-hearth furnaces is the yield of steel per unit time for each square meter of furnace floor; in motor transport it is the level of the load on trucks relative to their carrying capacity and the amount of freight carried; the use of earth-moving equipment is determined by the amount of earth removed; and utilization of agricultural equipment is determined by the volume of farming operations performed.

But it is not enough to merely elucidate the overall results of the utilization of equipment. It is important to know which measures are responsible for their achievement and what unused potential exists at the enterprise. To that end it is important to examine the indicators reflecting the productivity of equipment and its utilization with respect to time of operation.

Data on the shift coefficient are analyzed in order to describe the utilization of equipment in terms of operating time. In this it is advisable to make a computation showing the amount of additional output possible if the load on equipment is increased within a two-shift schedule.

The collective of the Voronezh Production Association for Manufacture of Heavy Mechanical Presses performed a set of measures in the 10th Five-Year Plan aimed at raising the shift coefficient of equipment operation. During the 5-year period the shift coefficient rose from 1.5 to 1.7. Thanks to the rise of the shift coefficient the annual volume of production rose 6 million rubles in this association. A plan has been drafted in the association covering a further rise of the shift coefficient during the 11th Five-Year Plan.

Improved utilization of existing equipment is directly dependent on the effort made to reduce idle time lasting less than one shift. Since all downtime of equipment is not entered in the records, it is advisable to conduct periodical

time studies of the utilization of basic production equipment by compiling what are called observation cards in the course of the workday. The study of these data yields valuable material making it possible to determine the entire amount of downtime and its causes and to conduct measures to eliminate losses of work time.

Automated recording of the utilization of every unit of equipment and machines is being organized at many enterprises. The recording system provides for identifying downtime lasting an entire day and downtime lasting less than one shift. A study of data on the load on equipment and machines makes it possible to see which groups of equipment are being poorly utilized and which have their maximum load, where bottlenecks have turned up in production and what needs to be done to eliminate them. This kind of analysis should be conducted not only for the enterprise as a whole, but also for shops, sections and the various types of equipment.

It is very important to analyze the level of utilization of the production capacity of an association, enterprise, shop or section. The principal source of material for the analysis is the passport of the enterprise (association), which is revised annually. It contains a specific section entitled "Production Capacity and Its Utilization."

The production capacity of any enterprise, shop or section is determined mainly by the amount and makeup of equipment, by progressive standards concerning its utilization, by the list of products produced and by the labor intensiveness of those products. It is in that sequence that the factors influencing the level of utilization of capacity are analyzed.

It is important to analyze the utilization of equipment by every work team and every worker, to pay attention to the preservation of equipment assigned to them, and to set up the necessary recordkeeping system for that purpose.

As we have already noted, the search for unused potential has been well organized in the collective of the Sumy Machinebuilding Association. The analysis was based on standards for utilization of capacity assigned for each production subdivision. Actual utilization of capacity is analyzed regularly beginning with the work team, the section and the shop, and ending with the association as a whole.

The analysis is done by the economic statistics services with the help of voluntary economic analysis bureaus. The performance of production collectives is evaluated according to the results of the analysis. An effective incentive system has also been introduced. Its principles are sufficiently clear: the higher the coefficient of utilization of capacity, the larger the size of the bonus.

Nor are the results achieved by the association any accident. Nearly 5 million rubles of additional output was produced in the association during the 10th Five-Year Plan by virtue of better utilization of production capacities.

All of our country's workers have an interest in better utilization of fixed productive capital, capacities, every machine and all equipment. The better the utilization of fixed capital, the smaller the funds required to augment output. That is why intensive utilization of equipment, raising the output-capital ratio, is an effort that concerns everyone.

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